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ABSTRACT

Upon identification of the environmental robustness (social interaction) perceived by students and teachers in 6 classrooms in a predominantly black 185 pupil rural secondary school in Georgia, this field study describes and contrasts the structural features of classrooms as a means of producing an improved operational understanding of classroom robustness. Characteristics identified in high robustness classrooms include spontaneous student involvement in tasks; the teacher as a dynamic focal point for the class; informal classroom atmosphere; teachers who tend to be humanistic, flexible, relaxed, and confident. The Learning Environment Inventory (robustness relationships derived from analysis of variance) suggests that as classroom robustness increases, classroom organization involves less formal rules and regulations, a pace of work which is comfortable for students, just and universal application of student privileges, subject matter well within the ability levels of students, student satisfaction about tasks, clear objectives for student work, and sufficient flexibility in structure to allow for cliqueness. These findings support the central hypothesis: that environmental robustness is inversely related to organization routinization. The atypical sample school suggests caution in generalizing these findings to other classroom settings. (NEC)

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DIMENSIONS OF ROBUSTNESS IN CLASSROOM ORGANIZATION

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Dimensions of Robustness in Classroom Organization

The notion that social interaction in school organizations can be understood using Goffman's (1967, 1963, 1961 or 1959) theatrical analogies, which identify actors, plot, setting and audience, serves as the conceptual base of initial inquiries focused on the relationship between school structure and environmental robustness. Environmental robustness as a theatrical construct was first understood in these terms and defined as the perceived "dramatic" content of school structure for a specific audience, i.e., teachers, administrators, parents or students (Willower and Licata, 1975). The robustness construct focuses on audience perceptions of school structure, similar to the perceptions and empathy experienced by an audience viewing a dramatic performance at a theater. From the begining of investigation examining the robustness construct, there has been some concern about specifying operational definitions applicable to everyday life in classrooms and schools. The purpose of this paper is to do exactly that, to describe, as part of an on-going line of inquiry, classroom robustness in terms of more specific (less abstract) definitions.

Related Research

Licata and Willower (1975) have investigated conflict between student and teacher subcultures in school organizations viewing the student and teacher antagonists as actors in a scene that can provoke considerable empathy within the student audience, perhaps even within the teacher audience. They suggest that the dramatic impact of school structure such as inter-scholastic sports competition, final examinations, or graduation exercises

can be understood in terms of audience empathy for the actors and the perception of situational drama or environmental robustness. In developing an operational measure for such perceptions of robustness in schools, Licata and Willower (1978) employed ten adjective pairs and seven point semantic differential scales (Osgood, Succi and Tannenbaum, 1957).

The robustness measure is composed of the following adjective pairs: interesting - boring, challenging - dull, active - passive, unusual - usual, powerful - weak, thrilling - quieting, important - unimportant, fresh - stale, meaningful - meaningless, and action-packed - uneventful. Adjectives which connote robustness are interesting, challenging, active, important, fresh, meaningful, action-packed, unusual, thrilling and powerful. Audience responses to a particular school concept are measured in terms of ratings of these adjectives. The higher the score, the more robust the concept. Scores range from 10-70 for a particular concept measured by this Robustness Semantic Differential (RSD).

The RSD adjective pairs emerged from a factor analysis of the concept DRAMATIC and are representative of a single factor accounting for over two-thirds of the test variance. The ten pairs produced Pearson test-retest correlation coefficients ranging from .40 - .67 and Spearman correlation coefficients ranging from .42 - .65. Test-retest coefficients for the total instrument were .77 (Pearson) and .78 (Spearman). Concurrent validity was demonstrated for the ten pairs based on their ability to significantly discriminate between the concepts DRAMATIC and NOT DRAMATIC (Licata and Willower, 1978). In addition, adjectives like fresh, interesting or thrilling suggest a degree of face validity as potential descriptors of dramatic events and structure in schools.

Initial research with the RSD produced significant relationships with

a number of meaningful school concepts. Significant positive relationships emerged between secondary students' perceptions of school robustness and a clear goal structure in school classes, friendly interaction between students, diverse student interests and activities, a minimum of student anxiety over favoritism, disorganization and apathy, and somewhat suprisingly, a reduced degree of competition between students in school classes. While significant correlations were not apparent between elementary student's perceptions of school robustness and school climate, their perceptions of the effectiveness with which the principal attends school activities and talks to school classes about their misconduct were significantly related to their perceptions of school robustness. Secondary students' perceptions of school robustness were significantly related to the perceived frequency with which the principal attended school activities and assisted teachers in supervising school activities (Licata, Willower and Ellett, 1978). Multauf, Willower and Licata (1978) found that custodial teacher behavior in controlling students' conduct was perceived by elementary students as being negatively associated with classroom robustness. Similar findings report the same inverse relationship between teacher custodialism in pupil control behavior and classroom robustness in secondary schools (Estep, Willower and Licata, 1979).

Brown and Licata (1978) found that elementary students' perceptions of teacher custodialism with respect to pupil control behavior were positively related to the perceived robustness of student resistance, negatively related to the perceived robustness of the teacher's pupil control behavior and the degree to which the teacher is liked by students. Earlier, Licata and Willower (1978) noted that, in secondary school, students who like school see it as being significantly more robust than those who are neutral or negative about school. Teacher views of the robustness of relevant

organizational roles, i.e., teacher, principal, and students, were significantly correlated to favorable attitudes about their effectiveness as educators, their opportunities for professional performance and development, and the quality of supervisory relations (Ellett and Licata, 1978).

Purpose

While these initial inquiries suggest that environmental robustness is a viable perspective in describing variation between and among learning environments in educational organizations, there is still a need to operationalize the construct in terms of everyday-life in schools and classrooms. For instance, how are classrooms which are perceived by students or teachers as being relatively high in robustness different from classrooms perceived by these same audiences as being relatively low in robustness? In order to answer such a question, researchers must identify such classrooms, and through field study methodology, describe the differences in the routine ways these organizations operate. Such are the purposes of this investigation: the identification of sample classrooms which are perceived by students and teachers as varying substantially in robustness, and the field study of these classrooms by a team of observers attempting to describe and contrast the structural features of these classrooms as a means of producing an improved operational understanding of environmental robustness.

Method

Sample

The investigators selected six secondary classrooms in a small rural secondary school in Georgia for study. The student enrollment for this school was 185 students in grades eight through twelve. The students represented a

variety of socio-economic backgrounds with the majority of students coming from families with relatively low income levels. The racial composition of the school was predominantly black. There were eleven teachers and a principal on the professional staff. The building and facilities were old and in poor repair, at least in part because the school was to be closed at the end of the year due to consolidation and desegregation pressures in the school district. Traditional grade levels and subject areas characterized the instructional pattern of this somewhat atypical school.

The teacher and the students in each class conducted during a single school day were administered the RSD instrument using the concept "This class is..." The purpose of this administration was to estimate relative robustness from teacher and student perspectives. The mean student RSD score for a particular class and the individual teacher's RSD score for a particular class served as operational measures of robustness. Since it was impossible for every teacher or student to rate every class, the investigators were forced to make certain assumptions in comparing these various RSD scores (1) that there would be little variability between various respondents relative to their perception of classroom robustness, i.e., one group of students (or one teacher) would tend to rate a particular class the same as another group of students (or another teacher) and (2) by selecting class robustness scores which were extremely high or low the researchers tended to reduce the reliability problem inherent in the first assumption. Keeping this in mind and realizing that only a very rough estimate of relative robustness was possible, the researchers initially selected four classes for study: a ninth grade physical education class and an eleventh and twelth grade Physics class rated relatively high in robustness; and an eleventh and twelfth grade English class and a ninth grade History class rated relatively

low in robustness. Table 1 presents both teacher and student RSD scores for these classes, recall that 10-70 is the range of possible scores for the RSD.

In addition to the RSD scores for these classes, teachers for the classes completed a Pupil Control Ideology Form (PCI), reported their years of teaching experience and the percentage of A, B, C, D and U grades assigned in the class for the previous marking period. Students in these classes responded to the Pupil Control Behavior Form (PCB). The PCI is a measure of teacher attitudes about pupil control on a humanistic-custodial continuum, the range for the twenty-item instrument is 20-100, the higher the score, the more custodial the teacher's attitude (Willower, Eidell and Hoy, 1973). The PCB, a similar twenty-item instrument, completed by students, operationalizes a teacher's pupil control behavior in terms of a class PCB mean score ranging from 20-100 with the higher score connoting custodial behavior (Helsel and Willower, 1974). As table 2 shows, the low robustness classrooms tended to have teachers with more custodial pupil control ideology and behavior scores than the high robustness classes. This finding, consistent with previous findings suggesting a strong inverse relationship between classroom robustness and pupil control ideology and behavior (Willower, Multauf and Licata, 1978), did not contradict the initial selection and identification of the high and low robustness classes involved in this study. The teachers in the high robustness classrooms tended to give higher and less varied grades than teachers in the low robustness classrooms. Teaching experience ranged from 5-27 years with the most variation (5 years for the physical education teacher and 27 years for the physics teacher) taking place between the two teachers in the high robustness classrooms.

Table 1. RSD Scores for High and Low Robustness Classes Selected for Observation

High Robustness Classes	Teacher RSD*	Student $\bar{X}$ RSD**
Physical Education (grade 9)	52	56
Physics (grades 11 and 12)	52	55
Low Robustness Classes		
English (grades 11 and 12)	42	37
History (grade 9)	44	35

* Teacher RSD scores ranged from 67 - 39.
** Student RSD mean scores ranged from 56 - 35.

Table 2. Selected Characteristics of the High and Low Robustness Classes

High Robustness	PCI	PCB	Teaching Experience	Percentage of Grades* A	B	C	D	U
Physical Education	55	60	5 years	100	0	0	0	0
Physics	53	35	27 years	35	57	0	0	8
Low Robustness								
English	62	70	27 years	10	20	30	19	21
History	67	71	15 years	13	8	25	16	38

*Grades given during the last marking period (A = excellent, U = unsatisfactory)

Field Study Technique

The field study method employed in this study bears some similarity to the methodology employed by Wolcott (1970) and Willower (1968). The role of participant observer was flexibly rather than rigidly applied (Zelditch, 1962). Field notes contained observation and interview data along with the investigators' reactions to the data. These notes were kept in a journal and reviewed regularly to articulate possible relationships between descriptive and conceptual interpretations of the data.

Three observers, the school's principal, the school district's reading supervisor and a member of the faculty of educational administration at a local college, constituted the field study team for this investigation. The first two members of the team made their observations from the role of "participants as observers." That is, these observers had membership in the system before the study was begun and therefore were able to interact naturally with teachers and students. They had access to hidden agendas, motives and meanings which might not be readily noted by an outsider (Lutz and Iannecone, 1969). The third member of the team, not a member of the system, observed from the role of "nonparticipant as observer" with the advantage of an outsider's detachment yet the freedom to consult with the team members who were system participants. Observations were made during April and May, 1978.

Observations

The 9th Grade History Class

The class was composed of 22 students, predominantly black. This group, the teacher claimed, was the "slow" group. Students were seated in rows which were perfectly straight, each desk exactly in place. The teacher stood "guard-like" at the head of the class. The blackboards, old, faded and

difficult to read, were covered with the teacher's handwriting. When the students arrived each day, they sat down immediately and began copying off of the blackboards. There was little explanation by the teacher, the students seemed to know exactly what was expected. The scene was somewhat reminiscent of monks at a monestary transcribing the scriptures. This pattern was repeated daily. Pupil control problems were nonexistent, no one dared misbehave. A paddle sat conspicuously on top of the teacher's desk as a grim reminder of the consequences of misbehavior. Student brinkmanship (Licata and Willower, 1975) was infrequent and mild: getting up to sharpen a pencil or to read the blackboard better, and milking the activity for all the time it was worth were examples of such behavior.

The teacher replied, "Make your letters distinct and legible," or "Make sure those magazines are straight," emphasizing the formality of classroom organization. The bulletin board read, "The other basics: self-confidence, self-reliance and self-discipline," yet classroom patterns tended to be coercive and based on external control of students. The bulletin board did not change and neither did the teacher's dress. Each day he wore a khaki shirt and trousers, the same color, over and over again. The instructional materials were two-dimensional, "bookish," emphasizing a strict routine of paper work. In interviews with students, the phrase "boring routine" was repeatedly used by students to describe the class. It is interesting to note that their negative attitudes focused on the tedium of classroom life rather than the teacher.

The 11th Grade English Class

This class was composed of 11th and 12th grade students. Half of the class, black males, sat at the rear of the classroom, while the other half of the class, predominantly white females, sat in the front of the room. Hostility between students and between students and teacher was apparent. For example, one black student looking for a pencil to borrow was repeatedly

turned down by his classmates (both black and white). The teacher confided his hostility toward the black students, "I wasn't prejudiced before I came here, but now I am. They're just a bunch of ..." He would deal with them sarcastically and remind them that graduation was close and that he couldn't care less about whether or not they passed.

In many ways, the patterns of classroom organization were as rigid as in the history class and if something began to stir student interest, the teacher would immediately cut off the activity. In a theatrical sense, the teacher would inevitably "step on his own lines" and stifle audience response. Students and teacher viewed the classroom activities as tedious chores. As with the history class, paperwork was basic to instruction, the teacher stood stationary at the head of the class and rules were strictly enforced. One female student remarked when asked to write a description of a laundromat, "can't we do something more interesting?" Similar to the history class, at the end of class many students would stretch and yawn before getting up to go to the next class.

The 9th Grade Physical Education Class

This class of 15 female students, both black and white students, were clearly prime forces in class activities. The student leader, known as "gorilla," a fine athlete, ran the activities. Nicknames among students such as "onion" or "old woman" gave a certain semantic color to social interaction. Both students and teacher used these names in refering to these students. There was a great deal of joking visa via "put-down" humor involving both teacher and students. No one seemed to take offense, some appeared to be comforted by the recognition. Students were spontaneously involved in the games and activities. They cheered, encouraged, reprimanded bad play or lack of effort, settled most of their disputes (otherwise the teacher's judgement prevailed), or screamed with excitement over an unusual play. The teacher sat on the sidelines watching,

making an occasional comment about play or settling a rare dispute.

An educatable/mentally retarded (EMR) student would often appear to mop the gym floor. His reward was a chance to play for awhile at the end of class after some of the girls left to "cleanup." "Cleanup" meant a conversation or smoking break in the locker room the last five minutes of class. Students viewed the class as a place for students, to play, to meet, and in the case of the EMR student, for escape. The teacher only set the stage and the props, the students extemporaneously cast the players and filled in the script as the action unfolded.

The 11th and 12th Grade Physics Class

The teacher of this class was a soft-spoken, easy-going type. He reminded the researchers of a shop foreman as he moved from one lab table to another to give his eleven students advice. This class was predominantly composed of white students working in pairs at each table. The teacher rarely lectured, he felt, "... long lectures are boring; I only lecture for a few minutes to give important information." The teacher responded openly and in depth to students' questions. When students would ask why their experiment did not turn out as expected, the teacher pursued this opportunity to evoke questions and answers from the students causing them to discover the problem for themselves. Humor was an important part of student-teacher interaction. One day, the instructor made an announcement to the class that the experiment they were scheduled to do with Alka Seltzer was to be replaced because, "someone took the Alka Seltzer." Everyone laughed and went immediately back to work on their experiments which often provoked student jokes and scenarios about "explosions." Students had plenty of time to do their work and visit socially with their friends.

Deviant Cases

Table 3 contrasts and compares the observed structural features of high and low robustness classroom organizations involved in this study. In reviewing these characteristics, the observation team began constructing a tentative generalization about the relationship between classroom structure and environmental robustness. They suggested that the medium of instruction in high robustness classes tended to be three-dimensional or "hands-on" in nature. In the low robustness classes, the media tended to be two-dimensional or "bookish" in nature. The observers decided to look back at the original robustness ratings of the classes in the school and to determine if there were any "hands-on" type of courses that respondents rated relatively low in robustness and any "bookish" type of courses that respondents rated relatively high in robustness.

At least two classes did not conform to the generalization made concerning instructional media and environmental robustness. These two classes were selected for observation as possible deviant cases. One of these was an eighth grade English class rated relatively high in robustness; the other, rated relatively low in robustness, was a typing class consisting of tenth, eleventh, and twelfth grade students. It is interesting to note that both students and teacher rated the English class as being relatively robust; but in the typing class, the teacher rated the class as being relatively robust and the students rated it relatively low in robustness. Table 4 presents these data.

The English class, predominantly black students, met during the last period of the school day. The teacher, a beginning teacher in a long-term

Table 3. Characteristics of High and Low Robustness Classes

High Robustness Classrooms	Low Robustness Classrooms
Spontaneous student involvement in task, task activity would probably continue in the absence of the teacher.	Students and teacher view much of task as a chore. It is doubtful that students would continue their work in the absence of the teacher.
The teacher seems to be a moving, dynamic focal point for the class.	The teacher establishes a stationary position or focal point in front of the class.
The classroom appears to be a place for meeting with friends and where peer relationsips among students are as integral a part of classroom interaction as relationships with the teacher.	The teacher seems to dominate interaction in the class and there is very little opportunity for interaction among students.
Student leadership seems to emerge naturally from the student group resulting in reduced status differentiation between students and teacher.	Teacher dominance tends to stifle student leadership and reinforce status differentiation between student and teacher. Social distance between teacher and student is strictly enforced.
The class atmosphere appears "shoplike," informal with students holding a degree of autonomy over their workspace. The teacher consults rather than supervises.	The class atmosphere is formal and autocratic stressing close supervision of student work by the teacher.
The teacher tends to "halo" expectations and attitudes about students and their work. Students are viewed as trustworthy and predominantly self-motivated.	The teacher tends to hold negative expectations and attitudes about students and their work. Teacher doubts student ability to be self-motivated.
Students see the class as "fun" and look forward to attending it.	Students see the class as a "dull, boring routine."
Teachers tend to be more humanistic, less coercive, in pupil control ideology and behavior.	Teachers tend to be more custodial, less humanistic, in pupil control ideology and behavior.
The teacher tends to be flexible in administering classroom rules and regulations.	The teacher rigidly enforces rules and exceptions are rare or non-existent.

Table 3. (continued)

High Robustness Classrooms	Low Robustness Classrooms
The teacher is relaxed and confident and is likely to respond openly and in depth to student questions and even pursue the students' line of thought.	The teacher seems to be on guard at all times, defending his domain, responding briefly or tersely to student questions.
The teacher's dress is varied, casual, sometimes colorful and appears to be a nonverbal clue of openness and the valuing of individuality.	The teacher's dress is often uniform-like, unvaried and colorless. It tends to suggest standardization and impersonal relationships with students.
Students appear to move around freely either through "brinkmanship" patterns or through flexible classroom structure.	Student movement is restricted. Brinkmanship, long pencil-sharpening trips, yawning openly, feigned confusion over assignments, allows student movement.
Teacher displays a sense of humor, laughing, joking and badgering students; often calling students by nicknames.	Teacher remains expressionless, uses little humor and ignores the informal system of students.
The students seem to express empathy, not only for one another but for classroom activity. This sometimes results in students "acting-out."	Emotional inhibition seems to be encouraged in the classroom. Student empathy with each other and classroom activity is at a minimum.
Student misbehavior is a low risk activity	Student misbehavior is a high risk activity.

Table 4. RSD Scores for the Selected Deviant Cases

High Robustness (bookish)	Teacher RSD*	Student RSD**
English (grade 8)	51	55
Typing (mixed grades)	61	38

*Teacher RSD scores ranged from 67-39.

**Student RSD mean scores ranged from 56-35; N=33
(Typing=15) (English=18)

substitute role, mentioned to one observer, "I can't control this class, so don't expect much." Indeed this was the case, the class was chaotic and marked by frequent student misconduct. The teacher seemed ambivalent about his duties as a disciplinarian. For instance, on one occasion he walked by an observer's seat and said with some bravado, "Watch this, you're going to see a paddling." He caught the students red-handed, but they soon talked him out of the spanking. He appeared to be just too nice to take a firm stand with these students. He was a great foil for their antics and even rewarded their classroom work with comic books to read at the end of the period. Structure and control were lacking and any attempt by the teacher to restore the routine was quickly thwarted by student misconduct.

In the typing class, an equal mix of black and white students kept busy typing assignments from a workbook. There was little interaction between students and very rarely did students leave their seats. Some students, even though it was nearing the end of the course, pecked away diligently with only one finger. On the blackboard, "18 days left in school," seemed more to be a reminder of the time left to finish tasks required for a passing grade than as an expression of mutual anticipation of summer vacation. The teacher, another long-term substitute, stalked the class with the same kind of custodial demeanor as the teachers in the initial two low robustness classes. As was the case in other low robustness classes, students felt the routine was boring, attempted to break the tedium through long pencil sharpening trips or by borrowing something from a classmate. The characteristic student stretching and yawning at the end of class, common to all low robustness classes, could be observed here also. Little explanation could be found as to why this teacher rated this class relatively high in robustness, a perception clearly counter

to those of the observers and the students.

It was apparent that the initial hypothesis about a relationship between environmental robustness and instructional media was not supported by the observations in these last two classes. The eighth grade English class predominantly employed two-dimensional media, but in terms of the perceptions of observers, students and teacher, the class was a relatively exciting and dramatic social situation. The typing class predominantly was a "hands-on" type of medium (though workbooks were involved), but low robustness adjectives like dull, boring or quieting were used by observers and students to describe classroom interaction. The search for a common conceptual theme produced a revised proposition or hypothesis about the relationship between environmental robustness and classroom organizational structure:

> Proposition: In classrooms, environmental robustness is inversely related to organizational routinization.

The proposition suggests that as classroom organizational structure becomes more routinized, i.e., more patterned and repetitive (Merton, 1968), the less robust, i.e., the less interesting, meaningful or challenging is the classroom environment. Routinization is hardly a new perspective. Bidwell (1959) has described school organizations in terms of batch processing of students, standardization of its service procedures, age-grade placement of students and standardization of socialization experiences. Jackson (1968) has suggested that classroom routinization results in a relatively constant social context, a context characterized by the cyclic, almost ritualistic class activities. Each activity, "seatwork," "group discussion," and "teacher demonstration" occur with clock-like precision and are accompanied by rules which students are expected to understand and obey. Relatively high degrees of routinization were common to all three low robustness classrooms observed. In these classes,

standardization and repetition, i.e., copying from the board day after day, typing one assignment after the next, "seatwork" rigidly enforced, strict application of formal rules and sanctions, deliberate teacher behavior which reduced the possibility of any surprises or even variation in classroom activity, produced a relatively boring and dramaless classroom environment.

In the high robustness classes there was reduced repetition and standardization in classroom organizational structure. The physical education class, while routinized to a degree, was a place where students could move around freely, plan and organize their play, enjoy variety and spontaneity, and rely on flexible application of rules. The physics class with its shop-like atmosphere, teacher jokes and student scenarios about "explosions," free movement and interaction between students, and relatively humanistic patterns of rule administration, exhibited lesser degrees of formality and routinization. Finally, the eighth grade English class, in which students themselves, rather than the teacher, broke the routines of classroom life through acts of misconduct, in a very different way, illustrated the relationship between robustness and routinization. In each case, routinization and formality were reduced by either student or teacher behavior, or both. As routinization decreased, the possibility of a more exciting and unpredictable organizational setting increased.

Selected Teacher Behaviors

In order to cross-check field observations against data from alternative instrumentation and data sources (Denzin, 1970), the researchers employed supplementary measures of the teacher's verbal behavior and teacher's behavior in controlling or disciplining students. A field observer, trained in the use of a standardized technique to assess teachers' verbal behavior,

and student responses to a paper and pencil instrument which measures their perception of the teacher's pupil control behavior composed at least part of the cross-check or triangulation process noted above. The purposes of these analyses are twofold. First, the results of this additional data collection are presented and analyzed as potential, less abstract descriptors of robust classroom environments. Second, these alternative analyses, perspectives or descriptors are compared and contrasted to the conclusions produced solely from field study observations, particularly as a way of testing the congruency or fit between an expanded data field and initial generalization.

Instrumentation

The Social-Emotional Climate Index (Withall, 1948) is a system that classifies each teacher statement into one of seven categories based on inferred intent. The seven categories are seen as falling on a continuum from "learner-centeredness" to "teacher-centeredness, 1 (learner-supportive), 2 (acceptant and clarifying) and 3 (problem-structuring) are learner-centered and 5 (directive), 6 (reproving) and 7 (teacher self-supporting) are teacher-centered. Category four (neutral) statements comprise polite conversation with no intent inferable. If most of a teacher's statements fall into categories 1, 2 or 3 than in 4, 5 or 6, the climate is said to be learner-centered; if more fall in 4, 5 and 6, it is said to be teacher-centered. While category 7 is a teacher-centered statement, it has shown to be a rare form of teacher verbal behavior. Inter-observer reliability coefficients range from .96 - .98 for the Social-Emotional Climate Index (SECI); internal reliability coefficient ranged from .47 to about .75 and .90 when the number of visits and observers are concurrently increased from two to twelve. (Medley and Mitzel, 1963).

The PCB (Pupil Control Behavior) Form is a twenty-item instrument which uses student perceptions to measure a teacher's pupil control behavior on a custodial to humanistic continuum (Helsel and Willower, 1973). Custodial PCB items are operationalized in terms of teacher behaviors which emphasize the distrust of students, maintenance of order, and a punitive, moralistic approach to pupil control. Humanistic PCB items are specified in terms of teacher behaviors which stress an accepting, trustful perception of students and optimism concerning their ability to be self-disciplining and responsible. Examples of items include: "MY TEACHER..." is bossy with students "(custodial)," is strict with students "(custodial)," is kind and considerate to students "(humanistic)," listens to student ideas "(humanistic)." The response categories for custodial items are weighted 5, 4, 3, 2, and 1 for "always," "often," "sometimes," "seldom," "never." Scoring is reversed for items reflecting the humanistic behavior mode. The score range from the instrument is from 20 - 100; the higher the score, the more custodial the perceived pupil control behavior.

As part of the initial development of the PCB, item-scale reliability coefficients for the twenty-items ranged from .68 to .93 with an average of .81. Further reliability analysis of the PCB produced an alpha coefficient of .92. The developers measured discriminent validity through an analysis of variance comparing two variance estimates which revealed significantly less variation among respondents describing the same teachers than among descriptions of different teachers. They estimated construct validity through significant positive correlations between PCB and the Pupil Control Ideology Form for teachers, counselors, principals and all educators combined (Helsel and Willower, 1975).

Data Analysis

The SECI was administered by a trained observer, a member of the field study team, visiting each of the six classrooms twice during a two-week period. The investigator developed a 7x4 contingency table and a chi square analysis to assess the relationship between teacher verbal behavior and classroom robustness. The seven response categories served as one nominal variable and the four classrooms as the other nominal variable. In a similar fashion, the researcher applied PCB responses, item by item, to a 5x4 contingency table and a chi square analysis to assess the relationship between pupil control behavior and classroom robustness. The five response categories served as one nominal variable, the four classrooms as the other nominal variable. In both analyses the researcher coded classrooms in terms of estimated relative robustness, the history class (1=least robust) to the physical education class (4=most robust).

Results

As table 5 indicates, a significant relationship emerged between the SECI and classroom robustness ($X^2 = 65.88$, df = 15, p = .001). The more robust classroom teachers tended to exhibit a higher percentage of their verbal behavior in categories 1 (16.5% and 12.1%) and 2 (33% and 39.4%) as compared to less robust teachers (2.3% and 0% in 1, 2.3% and 22.7% in 2). The less robust teachers tended to have a higher percentage of their verbal behavior scored in categories 3 (34.9% and 43.6%), 5 (30.2% and 25.5%) and 6 (9.3% and 3.6%) as compared to more robust teachers (30.8% and 12.1% in 3, 8.8% and 21.2% in 5, 2.2% and 3.0% in 6). Recall, categories 1 and 2 tend to be learner-centered, 3, 5 and 6 tend to be somewhat more teacher-centered.

Table 5. Chi Square Analysis of the Relationship Between SECI and Classroom Robustness

Classroom	SECI Categories													
	1		2		3		4		5		6		7	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
History	1	2.3	1	2.3	15	34.9	9	20.9	13	30.2	4	9.3	0	0
English	0	0	25	22.7	48	43.6	5	4.5	28	25.5	4	3.6	0	0
Physics	15	16.5	30	33.0	28	30.8	8	8.8	8	8.8	2	2.2	0	0
Physical Education	4	12.1	13	39.4	4	12.1	4	12.1	7	12.2	1	3.0	0	0
	$X^2 = 65.88$, df = 15, $P < .001$													

Category 4, idle conversation, no intent inferred, did not appear to discriminate between more or less robust teachers. Category 7 comments by any of the four teachers did not surface, not unlike previous research noted by Medley and Mitzel (1963).

In viewing table 6, the item by item chi square analyses of the twenty-item PCB produced 17 significant relationships with classroom robustness, suggesting that the more humanistic student perceptions of teacher pupil control behavior, the more robust the classroom. Significant chi squares ranged from 23.69 to 55.49 with 12 degrees of freedom; significance levels ranged from less than .05 to less than .001. While items 6 (speaks harshly to students), 18 (gets angry at students) and 20 (is bossy with students) were not significantly related to classroom robustness, it should be noted that the distribution of responses on their contingency table tended to suggest the same relationship which was significant ($p = < .05$) on the other 17 items.

Discussion

In reviewing the results of the analysis of the relationship between teacher verbal behavior and classroom robustness, at least two interpretations of the results are possible. First, the data suggests that the more robust the classroom environment, the more learner-centered is the teacher's verbal behavior. This relationship is particularly apparent with respect to the frequency of SECI category 1 and 2 behavior. For purposes of specification, these categories are explained in detail below:

Table 3. Item by Item Analysis of PCB Scores with Classroom Robustness

PCB Items*	X^2	df	P
My teacher ...			
1. doesn't punish students	25.68	12	.01
2. is cheerful and pleasant	32.14	12	.01
3. doesn't get upset when students are noisy	26.24	12	.01
4. gives students freedom	34.90	12	.001
5. is friendly with students	38.91	12	.001
6. doesn't speak harshly to students	20.01	12	NS
7. says nice things to students	29.84	12	.01
8. is easy for students to talk with	34.07	12	.001
9. is not strict with students	28.31	12	.01
10. smiles when students are around	55.49	12	.001
11. listens to student ideas	46.58	12	.001
12. doesn't threaten to punish students	27.51	12	.01
13. let's students decide things	48.22	12	.001
14. treats students as if they were as good as adults in school	27.35	12	.01
15. isn't mean to students	52.16	12	.001
16. finds time to listen to student problems	23.69	12	.05
17. is kind and considerate to students	31.75	12	.01
18. doesn't get angry at students	14.17	12	NS
19. asks for student opinions	47.93	12	.001
20. isn't bossy with students	14.09	12	NS

* All items are stated as descriptors of teachers in robust classrooms, underlined words are added by authors to show the direction of the relationship.

Category 1: Learner supportive statements that have the intent of reassuring or commending the pupil.

Category 2: Acceptant and clarifying statements having an intent to convey to thepupil the feeling that he was understood and help him elucidate his ideas and feelings (Withall, 1969 and 1949).

Second, the results suggest that less robust teachers tend to be rated more teacher-centered in their verbal behavior, but not extremely so. Their verbal behavior tended to be rated predominantly in terms of categories 3 (typically learner-centered), 5 and 6 (typically teacher-centered). Again, for purposes of specification and contrast these categories are explained below:

Category 3: Problem-structuring statements or questions which proffer information or raise questions about the problem in an objective manner with intent to facilitate learner's problem solving.

Category 5: Directive or horative statements with intent to have pupil follow a recommended course of action.

Category 6: Reproving or deprecating remarks intended to deter pupil from continued indulgence in present "unacceptable" behavior (Withall, 1969 and 1949).

While there appeared to be a significant relationship between learner-centered verbal behavior of teachers and classroom robustness, it may be worth noting that all teachers tended toward this end of the continuum. None were caught making self-supportive, category 7 statements. Category 4, idle conversation, tended to be just as likely in each of the four classrooms.

While previous research (Multauf, Willower and Licata, 1978 and Estep, Willower and Licata, 1979) has suggested a strong negative relationship

between custodial pupil control behavior as perceived by students and student perceptions of classroom robustness in both elementary and secondary schools, the researcher performed item by item analysis of the PCB with respect to classroom robustness for the expressed purpose of providing a field of more specific (less abstract) descriptors of classroom robustness. In Table 6, each item that is significantly related to classroom robustness appears to have some potential as a more particularized indicator or descriptor of robustness in classrooms. For example, it might be suggested generally that robust classrooms are more humanistic (PCB) and more specifically, that robust classrooms tend to have teachers who "give students freedom," "treat students as double if they were as good as adults," "smile when students are around," "don't get upset when students are noisy," "find time to listen to student problems" or "let students decide things."

As an aside, it is probably worth noting that these specific findings appear congruent with the results of previous analyses of teacher behavior and robustness based on quite different instrumentation and data sources. That is, we might suggest that in robust classrooms where teachers tend to be learner-centered and predominently use supportive, reassuring, acceptant and clarifying verbal behavior, they would also tend to be perceived as more humanistic in their pupil control behavior, i.e., "are cheerful and pleasant with students," "listen to student ideas," or "don't threaten to punish students." Consistent with this notion, there is some evidence to suggest a positive relationship between learner-centered verbal behavior and numanistic pupil control ideology of teachers (Rexford and Willower, 1972). Further, referring back to table 2, both the PCB mean scores PCI scores for the four teachers in this study were relatively more humanistic in behavior

and ideology for the two teachers in the more robust classrooms as compared to those in the least robust classrooms.

Related to the second purpose of these analyses, to compare and contrast findings here with field observations, these alternative instruments, data sources and analyses seem to support the field observations done almost simultaneously in these four classroom organizations. Field observations described the less robust history and English classes in terms of strict discipline and rigid instructional routines. Verbal behavior ranged from cool and formal in the history class to often antagonistic in the English class. In the history class, "a paddle sat conspicuously on top of the teacher's (history) desk as a grim reminder of the consequences of misbehavior." The more robust physics and physical education classes were marked by warmer and less formalized interaction between students and teachers. Humor was apparent in these two classroom settings and tended to reduce the tedium of class routines and increase spontaneity in classroom activities. Students tended to be self-disciplining, often initiating class activity.

Selected Student Perceptions

Instrumentation

As a final cross-check of field observations and subsequent generalization, each student in the initial four classrooms completed the Learning Environment Inventory (LEI). The LEI is a 105 item measure of student perceptions of everyday life in their classrooms. "Students are asked to follow a complicated set of rules," "the objectives of the class are specific," or "students are constantly challenged" are some sample items. Students express their disagreement or agreement with each statement on a four point scale ranging from "strongly disagree" to "strongly agree" (scored 0-4). The

instrument is divided into 15 distinct 7 item divisions or factors: cohesiveness, diversity, formality, speed, environment, friction, goal direction, favoritism, difficulty, apathy, democratic, cliqueness, satisfaction, disorganization and competitiveness. Typically, rather than being viewed as a 105 item, general measure of classroom climate, the items from each factor are summed to produce more specific factor scores. The resulting factor scores produce a multi-factor operational definition of classroom climate (Walberg, 1974).

Data generated from the development and use of the LEI in the evaluation of the Harvard Project Physics in 1969 using some 64 classes and 1048 students produced test-retest reliability coefficients ranging from .43 (diversity) to .73 (friction). Internal consistency coefficients range from .54 (diversity) to .85 (goal direction) (1973). Intraclass correlations ranged from .31 (diversity) to .92 (disorganization). (Anderson, 1973). Predictive validity data showing the relationship between LEI factor scores and school outcome variables like student learning and attendance are reported in several investigations (Ellett, Payne and Perkins, 1976; Anderson, 1970; Walberg and Anderson, 1968; Anderson and Walberg, 1968).

Data Analysis

Each factor of the LEI was subjected to a separate analysis of variance to determine if there were statistically significant differences in the factor mean scores for the four classes. In all analyses, the researchers again coded classrooms in terms of estimated relative robustness, the history class (1=least robust) to the physical education class (4=most robust). Since little rationale was available for prediction, the investigator applied a two-tailed test for significance. They also computed mean factor scores

for each of the four classrooms as well as for the total sample.

Results

As table 7 indicates, significant relationships existed between classroom robustness and seven of the fifteen LEI factor scores: formality ($F=7.22$, $df=3/63$, $p=.001$), speed ($F=14.43$, $df=3/63$, $p=.001$), goal direction ($F=3.20$, $df=3/63$, $p=.05$), favoritism ($F=6.48$, $df=3/63$, $p=.001$), difficulty ($F=4.24$, $df=3/63$, $p=.01$), cliqueness ($F=5.72$, $df=3/63$, $p=.01$), satisfaction ($F=7.20$, $df=3/63$, $p=.001$). An examination of factor mean scores on table 8 reveals relatively high mean scores for the high robustness classes on LEI goal direction (19.8 and 18.2 as compared to 17.2 and 19.2), cliqueness (20.6 and 18.3 as compared to 20.7 and 17.0), and satisfaction (19.4 and 17.3 as compared to 15.3 and 14.6). Low robustness classes had relatively higher mean scores on LEI formality (20.3 and 17.2 as compared to 16.9 and 17.7), speed (20.5 and 19.0 as compared to 14.4 and 16.7), favoritism (17.1 and 19.5 as compared to 13.6 and 16.1), and difficulty (18.9 and 18.6 as compared to 16.7 and 16.9).

Discussion

Recall that in a previous study of secondary students' perceptions of the relationship between school robustness and the LEI using a much larger sample, significant positive relationships emerged between students' perceptions of school robustness and goal direction, cohesiveness, diversity and reduced favoritism, disorganization and apathy (Licata, Willower and Ellett, 1978). Comparing the results of the LEI analysis done in this field study, only goal direction and favoritism (negatively related again) repeated as being significantly related to the robustness construct. It is probably worth noting that these results, while not totally congruent, do not appear to directly

Table 7. Factor by Factor Analysis of Variance on the LEI with Classroom Robustness

LEI Factor	df	MS	F	p
Cohesiveness	3/60	31.15	2.64	NS
Diversity	3/60	2.57	0.49	NS
Formality	3/60	34.00	7.22	.001
Speed	3/60	109.73	14.43	.001
Environment	3/60	11.11	1.55	NS
Friction	3/60	11.71	0.99	NS
Goal Direction	3/60	18.44	3.20	.05
Favoritism	3/60	75.48	6.48	.001
Difficulty	3/60	19.82	4.24	.01
Apathy	3/60	14.18	1.21	NS
Democratic	3/60	14.07	2.05	NS
Cliqueness	3/60	56.02	5.72	.01
Satisfaction	3/60	67.97	7.20	.001
Disorganization	3/60	25.94	2.73	NS
Competitiveness	3/60	5.94	0.97	NS

Table 8. Mean Scores for LEI Factors Significantly Related to Classroom Robustness

LEI Factors (and sample items)*	Phy. Ed. $\bar{X}$	Physics $\bar{X}$	English $\bar{X}$	History $\bar{X}$	Total $\bar{X}$
Formality	17.7	16.9	17.2	20.2	18.7
7. Students who break the rules are penalized.					
48. Students are asked to follow strict rules.					
59. My class is rather informal and few rules are imposed.***					
Speed	16.7	14.4	19.0	20.5	18.2
27. The pace of my class is rushed.					
73. My class has plenty of time to cover the prescribed work.***					
75. Students do not have to hurry to finish their work.***					
87. My class members feel rushed to finish their work.					
Goal Direction	18.2	19.8	17.2	19.2	18.6
10. Students know exactly what they have to get done.					
Favoritism	16.1	13.6	19.5	17.1	16.8
14. All students in my class enjoy the same privileges.					
74. Students who have past histories of being discipline problems are discriminated against.					
98. Certain students are favored more than the rest.					
Difficulty	16.9	16.7	18.6	18.9	18.0
13. The work in my class is difficult.					
101. Most students consider the subject matter easy.***					
Cliqueness	18.3	20.6	20.7	17.0	18.8
5. Certain students work only with their close friends.					
76. Certain groups of friends tend to sit together.					
100. Certain students stick together in small groups.					

LEI Factors (and sample items)*	Phy. Ed. $\bar{X}$	Physics $\bar{X}$	English $\bar{X}$	History $\bar{X}$	Total $\bar{X}$
Satisfaction 6. The students enjoy their classwork. 38. There is considerable dissatisfaction with the work of my class.*** 79. Students are well satisfied with the work of my class.	17.3	19.4	15.3	14.6	16.2

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* Sample items are those significantly ($<$ .05) related to classroom robustness in item by item analysis of variance.

** N=64 (Physics = 11) (Phys. Ed. = 15) (English = 15) (History = 23).

*** Scoring reversed for this item.

contradict each other. Perhaps the differences in the results of the two studies are best explained by sample differences and a shift from the perspective of school robustness to classroom robustness.

An examination of factor mean scores for the four classrooms varying in estimated robustness suggests that only speed, difficulty and satisfaction present a trend whereby there are apparent increases or decreases in factor mean scores corresponding to variation in classroom robustness. The other factors, formality, goal direction, favoritism and cliqueness, presented somewhat less clear-cut patterns of mean scores. For instance, cliqueness was highest in the low robustness English class ($\bar{X}$=20.7), the high robustness physics class ($\bar{X}$=20.6) and to a lesser degree the high robustness physical education class ($\bar{X}$=18.3) as compared to the amount of cliqueness reported in the low robustness history class ($\bar{X}$=17.0). While the results of the analysis of variance suggests a positive relationship between cliqueness and robustness, an examination of cliqueness mean scores across classrooms suggests something less than a linear relationship. However, the cliqueness mean scores do make some sense in terms of field observations: in the English class, the black students (male) were separated from the white (female) students; in the physics class, students (friends) worked in pairs; in the physical education class, a clique lead by "gorilla" dominated play. The history class, marked by limited, or unobservable interaction between students, provided little field observation data suggestive of clique formation.

In summary, the LEI - robustness relationships dervied from the analysis of variance suggests that as classroom robustness increases, classroom organization involves less formal rules and regulations (formality), a pace of work which is comfortable for students (speed), just and universal application of student privileges (favoritism), subject matter well within the

ability levels of students (difficulty), student satisfaction about task (satisfaction), clear objectives for student work (goal direction) and sufficient flexibility in structure to allow for the development of exclusive friendship patterns between and among students (cliqueness). Again, these findings do not appear to contradict the central hypothesis of the field study, that environmental robustness is inversely related to organizational routinization. Instead, they seem to suggest the kinds of classroom structure which facilitate student or audience perception of robustness in classroom environments.

Conclusion

It is probably worth emphasizing the tentative and exploratory nature of this inquiry into the relationship between environmental robustness and classroom structure. Limitations in methodology and sample suggest caution in generalizing these findings to other classroom settings. There is little question that the sample school and classrooms were somewhat atypical. It is difficult to assess the relationship of factors like a rural setting, small school size, socio-economic or racial imbalance to observed patterns of classroom interaction. Certainly, the impending termination of this school must have impacted on students and teachers alike, possibly altering the norms of school life. Bearing these cautions in mind, it should also be noted that the field observers were impressed on occasion by the marked similarity between everyday classroom life in this school and classrooms observed in more typical situations. Further, the marked similarities between the findings in this somewhat atypical setting and those of Multauf, Willower and Licata (1978) or Estep, Willower and Licata (1979) using broader, more typical samples in Pennsylvania suggests caution in disregarding these findings entirely. Rather, more comprehensive inquiry seems to be a reasonable follow-up of

this exploratory investigation.

One possible starting point for future inquiry might be the general proposition proposed from field study data: that there is an inverse relationship between the perception classroom robustness and classroom routinization. This generalization seems to make some sense in terms of the expanded data field produced through additional analyses. Rather than calling for revision of the basic hypothesis which emerged from this study, these new data tend to specify the hypothesis in terms of teacher verbal behavior, teacher pupil control behavior and student perceptions of classroom environment. At least in part, they suggest that as the routine verbal behavior of teachers become more self-supportive (less learner-supportive) and teacher disciplining of students become more punitive and coercive, the more tedious or less robust is classroom life, particularly in terms of student perceptions or feeling of empathy with class structure. The reverse is also suggested, that as the routine verbal behavior of teachers become more learner-centered (less teacher-centered) and the more teachers act in ways that cause students to be self-disciplining, the more challenging or robust is classroom life and student empathy with class structure.

Further, it is suggested that robust secondary classrooms tend to be perceived by students as having less favoritism, less formality, a relatively comfortable pace of work, relatively easy subject matter, clear goals and objectives, a degree of clique structure in the informal student system, and degrees of expressed student satisfaction over their tasks.

There is a temptation to speculate about the degree to which these conclusions can be generalized to the operation of an entire school or applied to other phenomena or contexts. Certainly, the relationship between classroom

robustness and student learning or teacher effectiveness merits some interest. In a recent study of educator "burnout" by Dolores Brookins and Joseph Licata at The Ohio State University, initial findings seem to suggest that "burnout" may be characterized by an individual's perception of a relatively "robustless" work environment, an environment marked by relatively high degrees of routinization leading to a lack of empathy with organizational structure. This unanticipated or unrecognized consequence of organizational routinization (although long ago recognized as a problem with assembly line workers in industry) may be applicable to educational roles such as administrators, teachers or students.

Instead of yielding to temptation to speculate further, such investigatory possibilities will be left to future inquiries. Future investigations might be well advised to focus on the hypothesis, constructs and definitions presented in this paper as tentative cadavers to be dissected in the light of further inquiry. How else can we increase our understanding of educational organizations?

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